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ABSTRACT

The purpose of this study was to longitudinally examine the development of symbolic play in 2-year-old Japanese infants. The subjects were four children who were individually tested once a month from the age of 12 to 24 months in laboratory settings. Assessment materials consisted of three sets of miniature toys, a doll and junk objects. Each set was presented to each subject for 5 minutes and the subject's spontaneous behavior was individually observed and tested by a female experimenter in the presence of his/her mother. Results indicated that although the developmental sequence of symbolic play was almost always the same, the developmental pace varied among the subjects. Symbolic manipulative play was preceded by the relational play. Non-relational manipulative play was dominant in general. Symbolic play went through a transition from imitative use to substitution and then to the gestural representation of absent objects, and a shift in agent use from self to passive other and then to active other. However, most symbolic play fell in the category of imitative use of self agent use. The mother, in contrast to the experimenter, was always the first passive other agent. Results further suggest a positive relationship of symbolic play to language development. As general indices for all stages in the development of symbolic play, the number of different acts was suggested to be more appropriate than the percentage of occurrence. Developmental characteristics of relational developmental play and egocentricism are discussed. (Author/RH)

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A LONGITUDINAL STUDY OF SYMBOLIC PLAY IN THE SECOND YEAR OF LIFE

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It has been suggested that the emergence and development of pretend behavior or symbolic play are based on cognitive development (Piaget, 1945/1962; Vygotsky, 1967; Werner & Kaplan, 1963). More recently, Jeffree & McConkey (1976) and Wing et al. (1977) have reported that the development of symbolic play is related to mental age rather than to chronological age in studies with retarded children. Symbolic play appears in the early months of the second year, more often and more clearly at about 21 months of mental age (Inhelder et al., 1972; Lowe, 1975; Wing et al., 1977). Prior to the emergence of symbolic play, the child's behavior goes from the non-relational to the relational manipulation of objects (Dale et al.; Fenson et al., 1976; Inhelder et al., 1972). It has been revealed that symbolic play goes through a transition from the imitative use to the substitute use of objects and then to the gestural representation of absent objects, or that it goes through a progression from simple symbolic play to elaborated symbolic play, e.g., varied, sequential, planned, etc. (Dale et al.; Elder & Pederson, 1978; Fenson et al., 1976; Inhelder et al., 1972; Nicolich, 1977; Piaget,

1945/1962). There is also a developmental sequence in agent use of symbolic play from self to passive other and then to active other (Inhelder et al., 1972; Lowe, 1975; Watson & Fischer, 1977).

Most of the above studies were conducted cross-sectionally except for those of Inhelder et al., Nicholich and Piaget. In addition, the gestural representation of absent objects and the agent use of active other were rarely found in studies with children under 24 months of age, although the former was reported by Piaget (1945/1962) and the latter was found after modeling procedures by Watson & Fischer (1977). Yet the occurrence of a precursor or a part of these behaviors might be seen in a longitudinal study. Therefore, this study was aimed at the longitudinal examination of the development of symbolic play in 4 children in a structured laboratory play situation over a period of one year from the age of 12 months to 24 months.

METHOD

1. Subjects

The subjects were 4 Japanese firstborn normal children (2 males, M.K., T.T.; 2 females, M.Y., H.H.) from middle-class families. They were selected from the files of the Well Babies Clinic at Kosei Hospital in Tokyo where their neurological, physical and psychological development had been examined monthly from 1 month of age. Their DQ's* at 12 and 24 months were as follows:

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* DQ (Development Quotient) was measured by the MCC Baby Test (Koga, 1967) which was modified from the Measurement of Intelligence of Infant and Young Children (2nd ed.) by P. Cattell (1960).

M.K., 91, 103; T.T., 122, 118; M.Y., 122, 114 and H.H., 123, 123.

2. Materials

The materials consisted of 3 sets of miniature toys, a doll and junk materials the latter two of which were common to each set. The doll was about 30 cm high dressed either as a boy or girl. The junk materials were 3 types of twigs (large, small and Y-shaped, 10-20 cm in length) and a crumpled piece of white paper (15 x 15 cm). The miniature toys in each set were as follows:

Set I tea cup, spoon, hat, cloth shoulder bag.

Set II rice bowl, plate, chopsticks, square table.

Set III coverlet, bed mat, pillow.

There was one of each object but chopsticks in which case there was one pair, in a size appropriate for the doll's use. Most of the miniature toys were white exclusive of the shoulder bag, the surface of the coverlet and the pillow which were yellow, and the table which was brown.

3. Procedure

The experiment was conducted in a small carpeted room at Kosei Hospital without any equipment except for 2 locked steel cabinets. The room was divided into two parts by a screen for observing and videotape recording. The subjects were individually tested by a female experimenter in the presence of his or her mother once a month from the age of 12 months to 24 months. Prior to a session, the experimenter let the subject choose a doll, boy or girl for each session. The selected doll and one set of materials were placed on a board in a given order and presented on the floor in front of the subject. Each set was presented for 5 minutes and the subject's spontaneous behavior was observed.

The order of presentation of the sets was counterbalanced across sessions. The mother was instructed neither to initiate nor to teach the manipulation of the materials. However, she was encouraged to play with her child, limiting her pretend behavior to her child's repertory when her child approached her in that way. The experimenter behaved in the same manner.

4. Recording

A trained observer took notes when there was difficulty in interpreting the subject's pretend behavior, especially when substitute use of the materials or gestural representation occurred. After each session, the observer asked the mother about these behaviors as well as the subject's pretend use of real objects in everyday life. The whole procedure was videotaped. The tape was copied and 1 sec time intervals were marked off. The observer cooperated with another trained observer to describe the subject's behavior with a given form based on the copied videotape recording and what the mother explained about her child's behavior.

RESULTS

1. Development of Manipulative Play

Manipulative play was categorized into three types, non-relational, relational and symbolic. The terms are defined in Table 1. The frequency of each of these three types of play was counted by whether it occurred or not in a 5 sec time interval. When two or more types emerged within 5 seconds, the more advanced one was recorded.

As shown in Fig. 1, in general during this period, non-relational

manipulation was dominant with the symbolic one appearing less frequently and the relational one appearing least of all. However, symbolic manipulation occurred more often than the non-relational one after around 21 months in two children (T.T. and H.H.).

While the developmental process from non-relational to relational manipulation was not seen in any of the subjects, the progression from relational to symbolic manipulation was clear-cut in M.K. The latter tendency was also seen in T.T. and H.H. where the percentage of occurrence of relational manipulation rapidly decreased at about 19 months prior to the emergence of symbolic manipulation as dominant.

2. Development of Symbolic Play

(1) General indices of development

Symbolic play includes gestural representation as well as symbolic manipulation of the material, i.e., imitative use and substitution. Gestural representation is defined in Table 1. The percentage of occurrence and the number of different acts were regarded as general indices for all stages in the development of symbolic play. The frequency of symbolic play was counted in the same way as that of manipulative play. The percentage of occurrence was calculated as follows:

$$\frac{\text{frequency of symbolic play}}{\text{frequency of non-symbolic manipulation and symbolic play}} \times 100$$

The above computation was used in order to exclude motivational factors as much as possible. When counting the number of different acts, the same act with different materials was counted as one, e.g., eating with a spoon and eating with a twig as a substitute for the spoon.

Since the frequency of gestural representation was very low or zero,

the percentage of symbolic play was almost the same as that of symbolic manipulation as seen in Fig. 1. The total number of different acts increased throughout the year, whereas the number of different acts in elaborated symbolic play* increased during the later months of the second year (Fig. 2). The developmental process from simple symbolic play to elaborated symbolic play was clearly seen in M.K. and T.T.

The total number of different acts was significantly correlated with age in months in all the subjects, but neither the percentage of occurrence nor the number of different acts in elaborated symbolic play was, due to the nonsignificant correlations in M.Y. (Table 2). Her behavior was probably influenced by a decrease in motivation starting around 18 months. She started spending more time in different play such as hide-and-seek, after briefly manipulating the experimental materials. Nevertheless, the total number of different acts was significantly correlated with age in month in this subject as well.

(2) Imitative use, substitution and gestural representation

The sequence of emergence from imitative use to substitution and then to gestural representation of absent objects was seen in almost all of the subjects, while the last type was not observed in M.K. and M.Y. (Table 3). However, imitative use was still dominant in all the subjects (Table 4).

(i) imitative use

As shown in Table 5, the first emergence of imitative use varied across the subjects including both real objects and miniature toys. In general, all subjects tended to use feeding utensils first, but then

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* See the definition in Table 1.

varied in their next use of other real objects. Yet there was a tendency for all subjects to use the miniature toys in the same sequence, usually feeding utensils, then hat or bag and then bedding. Imitative use of miniature toys appeared later than that of their real counterparts, especially with the bag and bedding in which the similarity between the miniature toy and the real object was less than the other objects. The initial age in months in the imitative use of a doll were as follows:

M.K., 22 months; T.T., 13 months; M.T., 14 months and H.H., 12 months.

(ii) substitution

Most of the subjects' substitution was based on their everyday experiences. In addition, there was a resemblance in form and/or quality between the signifier and the signified (Table 6).

By analyzing the behavior occurring just before substitution, the following developmental sequence was revealed (Fig. 3):

A. substitution of different acts from preceding non-symbolic manipulation or substitution of similar acts to preceding imitative use, e.g., walking around with a pillow in hand and then wiping mother's nose with it as a handkerchief, or stirring a cup with a spoon and then with a twig as a spoon.

B. substitution preceded by non-manipulation, e.g., looking at a twig and then drawing a circle with it as a pencil.

C. substitution of different acts from preceding imitative use or substitution, e.g., eating with a pair of chopsticks and then holding one of them between fingers and smoking it as a cigarette, or using a large twig as a gun and then as a sword.

D. substitution of similar acts to preceding substitution, e.g., riding on a table as a car with legs over each side and then going down it as a slide keeping the same posture.

E. substitution of similar acts to preceding non-symbolic manipulation, e.g., throwing a Y-shaped twig and then throwing it carefully, with the word, airplane.

In other words, the substitution of similar acts to preceding manipulation emerged later than that of different acts, except for the second type in A. However, the characteristics of this substitution were very distinctive from later types of similar acts, since it always occurred following relational imitative use of miniature toys and kept the same act merely by changing a part of miniature toys to a junk material. Hence, the representation of actions or movements was presumably small component.

Although the above developmental sequence was noted, most substitution seen was occupied with types A and B (M.K., $\bar{X}$ = 73.75%, SD = 36.38; T.T., $\bar{X}$ = 83.03%, SD = 28.22; M.Y., $\bar{X}$ = 92.86%, SD = 17.50; H.H., $\bar{X}$ = 86.37%, SD = 18.71).

(iii) gestural representation

As mentioned before, gestural representation of any kind occurred at a very low frequency or not at all (e.g., M.K.) throughout the year. Furthermore, the gestural representation of absent objects emerged only in T.T. and H.H., e.g., pretending to throw an imaginative object to mother (T.T. at 16 months), or pretending to give an imaginative object to mother (H.H. at 22 months). However, a possible precursor of this behavior was observed in M.Y. at 21 and 22 months such as taking an

imaginative candy out of a paper and then eating it. While it was counted as substitution of the paper, the imaginative candy seemed to be more emphasized in her acts. Such possible precursors were also found in T.T. and H.H. prior to the emergence of the gestural representation of absent objects, but not in M.K. The developmental process of the imitation of actions or movements to the gestural representation of absent objects was seen in H.H. but not in T.T.

(3) Agent use

The definitions of the terms on agent use are shown in Table 1. The sequence of emergence from self to passive other and then to active other was revealed within imitative use or substitution, while active other did not appear in the substitution of any subject (Fig. 4). Same agent use was delayed in substitution. The mother was always the first passive other agent regardless of the subject or a type of symbolic play. The doll was never observed as an active other agent in any of the subjects. Agent use in gestural representation was limited to the self or the mother as a passive other agent. However, most of the subjects' symbolic play fell in the category of self agent use (Table 7).

3. Individual Differences

Individual differences were found among the subjects with respect to the development of symbolic play. There was an especially marked contrast between T.T. and H.H. on the one hand and M.K. and M.Y. on the other.

The percentage of occurrence of symbolic play was generally higher in T.T. and H.H. than in M.K. and M.Y. (Fig. 1). Moreover, the former pair exhibited symbolic play more than 50% of the manipulative play from

around 21 months, while the latter pair's play was dominated by non-relational manipulative play until the age of 24 months. The total number of different acts was greater in T.T. and H.H. than in M.K. and M.Y. throughout the year (Fig. 2). M.Y.'s imitative use of miniature toys did not begin later than T.T. and H.H. (at 12 months), but M.K.'s delayed by 3 months (Table 3). While substitution began to appear at not so different ages among the subjects (Table 3), the contents of substitution were more varied in T.T. and H.H. (Table 6). Besides, the substitution of similar acts to preceding substitution or non-symbolic manipulation was not observed in M.K. or M.Y. (Fig. 3). The gestural representation of absent objects appeared only in T.T. and H.H. (Table 3). M.K.'s initiation of passive other agent use did not occur that much later than T.T. and H.H., whereas M.Y.'s was later by 8 months (Fig. 4). Active other agent use emerged only in T.T. and H.H.

DISCUSSION

1. Development of Manipulative Play

The developmental sequence of relational to symbolic manipulation was seen in this study, but the earlier developmental process of non-relational to relational manipulation was not revealed. This is presumably because of the experimental period with reference to the study by Fenson et al. (1976) where objects were manipulated in simple relations by most 9-month-olds.

In general, however, non-relational manipulation was still dominant to be exceeded by symbolic manipulation in T.T. and H.H. at about 21 months of age. Although motivational factors can not be ruled out as an

explanation for this as observed in M.Y., Dale et al. and Inhelder et al. (1972) indicated the same tendency. The superiority of non-relational manipulation, accordingly, can be regarded as a characteristic of the 12-24 month old age level. Relational manipulation occurred at a relatively low frequency in all the subjects as also reported by Inhelder et al. (1972), and decreased prior to the dominance of symbolic manipulation as seen in T.T. and H.H. Therefore, it is suggested that such a transitional behavior as relational manipulation occurs without exceeding the frequency of a preceding or succeeding behavior and supports the development of the succeeding behavior.

2. Development of Symbolic Play

(1) General indices of development

Among the variables used as general indices, only the total number of different acts significantly correlated with age in months in all the subjects. The other two indices did not correlate in M.Y. probably due to decrement in her motivation starting around 18 months of age. According to a study with normal and retarded children by Jeffree & McConkey (1976), the percentage of imitative actions (i.e., symbolic play) did not correlate with developmental age, but the number of different imaginative actions did. Hence, the number of different acts seems to be a more appropriate general index than the percentage of occurrence, although there seems to be a relation between them.

(2) Imitative use, substitution and gestural representation

A developmental progression was seen of first, imitative use then substitution and then the gestural representation of absent objects. Yet most symbolic play fell in the category of imitative use. This may

have been influenced by the unbalanced variety of miniature toys and junk materials presented. However, Jeffree & McConkey (1976) also found that even in children whose mean age was about 30 months, miniature toys were manipulated more often than junk materials with the same variety of them. Therefore, the dominance of imitative use can be interpreted as a characteristic of the 12-24 month old age level. In other words, the representational abilities of children of this age are not developed well enough for frequent substitution or the gestural representation of absent objects.

(i) imitative use

The first imitative use of real objects showed no particular order except for the use of food utensils first. In miniature toys, however, there was a general tendency for imitative use to start with food utensils, then go on to a hat or bag and then bedding. The former result is probably due to the discrepancy among subjects regarding their frequency of use of the real objects, their chances of observing another person's use of the real objects, the usableness of the real objects, etc. As far as the latter result is concerned, Lowe (1975) also found that the imitative use of food utensils appeared first and that of bedding emerged at a later age.

The imitative use of miniature toys was preceded by that of their real counterparts. It is possible that this sequence explains a discrepancy between a home setting and a laboratory setting. However, the time gap between imitative use of a real object and that of a miniature toy is large in a bag and bedding. And these two materials are less similar between their real objects and their miniature toys. Thus it is

more likely that this sequence is regarded as a discrepancy of representational ability.

(ii) substitution

Most substitution at this age level occurred when there was a physical resemblance between the signifier and the signified. This tendency was also noted by Elder & Pederson (1978). The substitution of similar acts to preceding manipulation did appear in later months. This suggests that the representation of physical attributes is an earlier developmental stage than that of actions or movements in the same domain.

(iii) gestural representation

Gestural representation of any kind occurred at a very low frequency and that of absent objects was only seen in T.T. and H.H. However, they did not represent the movement of objects. Overton & Jackson (1973) found that when expressing the movement of an absent object, 3-year-olds used a part of their bodies (e.g., using a forefinger and an index finger as the blades of a pair of scissors), but 6-year-olds moved the hand as if they were actually holding and operating the absent object. Thus it can be pointed out again that the representation of the movement of an absent object appears at a later developmental stage than that of the absent object itself.

The developmental process of the imitation of actions or movements to the gestural representation of absent objects was found in H.H. as reported by Piaget (1945/1962), but not in T.T. T.T.'s result might have been influenced by his less frequent occurrence of gestural representation than H.H. Therefore, the gestural representation of absent objects observed in T.T. and H.H. can be interpreted as an intermediate

stage between the imitation of actions or movements and the gestural representation of the movements of absent objects.

(3) Agent use

Agent use in 3 types of symbolic play showed a developmental progression from self to passive other and then to active other. However, active other agent use was not observed in substitution or gestural representation. The mother was always the first passive other agent. Thus this sequence is suggestive not only of how a child enlarges his cognition of the world (Lowe, 1975; Watson & Fischer, 1977), but also of how important his mother or caregiver is in his cognitive development.

Active other agent use can be regarded as a precursor of role play which appears at a later age. Since it does not occur in substitution, it is likely that sharing the contents of substitution will emerge later in role play. Piaget (1945/1962) reported it began around 4 years of age.

A doll was not used as an active other agent by any subject, which also was found by Inhelder et al. (1972) and Lowe (1975). Watson of Fischer (1977) revealed it after modeling procedures. Yet the mother as an active other agent was seen in T.T. and H.H. This may be explained as a precursor of the use of a doll as an active other agent.

Although a developmental sequence in agent use was seen, most of the subjects' symbolic play was occupied with self agent use. Consequently, it is explained children of this age are still egocentric, but not always so.

3. Individual Differences

The developmental sequence of symbolic play was almost always the

same, but the developmental pace varied among the subjects. In particular, T.T. and H.H. developed at a faster pace while M.K. and M.Y. developed at a slower pace. Such individual differences were also reported by Dale et al., Inhelder et al. (1972), Nicolich (1977) and Piaget (1945/1962).

T.T. and H.H. also showed a greater acceleration than M.K. and M.Y. in language development which requires symbolization as well. This was especially so in the increment of meaningful words and in the variety of sentence structure (Iitaka, 1979). The relationship of symbolic play to language development has been discussed by Inhelder et al. (1972), Lunzer (1959), Piaget (1945/1962), Singer (1973), Werner & Kaplan (1963) and so on. Lovell et al. (1968) reported a significant correlation between the mean number of morphemes per utterance and the amount of time spent in symbolic play. Bates et al. (1975) found co-occurrence of initial language and symbolic play. And Jeffree & McConkey (1974) succeeded in expanding a 3 year old Down's syndrome child's expressive language by the use of symbolic play. As opposed to these results, Dale et al. showed there was little correlation between symbolic play and pragmatics (and also the mean length of utterance) if age was partialled out. The discrepancy among the above results seems to depend on which variables were selected in the development of symbolic play and language. This study suggests a positive relationship between symbolic play and language development.

SUMMARY

The purpose of this study was to longitudinally examine the

development of symbolic play in the second year of life.

The subjects were 4 Japanese normal children and individually tested once a month from the age of 12 to 24 months in laboratory settings. The materials were composed of 3 sets of miniature toys, a doll and junk materials. Each set was presented for 5 minutes and the subject's spontaneous behavior was videotaped.

While symbolic manipulative play was preceded by the relational one, non-relational manipulative play was still dominant in general. The characteristics of relational manipulative play in the developmental process was discussed.

symbolic play went through a transition from imitative use to substitution and then to the gestural representation of absent objects, a progression from simple symbolic play to elaborated symbolic play, or a shift in agent use from self to passive other and then to active other. However, most symbolic play fell in the category of imitative use or self agent use. These results were discussed with reference to representational ability or egocentrism in cognitive development.

As general indices for all stages in the development of symbolic play, the number of different acts was suggested to be more appropriate than the percentage of occurrence. The representation of movement was indicated to be more difficult than that of physical attributes in the same domain such as substitution or the gestural representation of absent objects. The importance of a mother or caregiver in her child's cognitive development was revealed, since the mother was always the first passive other agent. Although the developmental sequence of symbolic play was almost always the same, the developmental pace varied

among the subjects with the same tendency in their language development. Thus the positive relationship of symbolic play to language development was suggested.

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Table 1 Definitions

Manipulative Play

Non-relational:
manipulation of one or more materials without any relation and the meaning of which is difficult to interpret, e.g., hitting the floor with a spoon, or merely holding a spoon and a cup in each hand.

Relational:
manipulation of two or more materials so they are put in a simple or appropriate relation to each other but the meaning of which is difficult to interpret or ambiguous, e.g., hitting a cup with a spoon, or putting a spoon into a cup but not drinking or eating.

Symbolic:
manipulation of materials according to their appropriate usage (i.e., imitative use), or as a substitute for other objects (i.e., substitution), e.g., eating with a spoon or with a twig.

Symbolic Play

1. imitative use of materials
2. substitute use of materials (i.e., substitution)
3. gestural representation without any material support
   (1) imitation of actions of the animate or movements of the inanimate, e.g., pretending to have a stomachache, bowing after a meal, or running around with arms up like an airplane.
   (2) gestural representation of absent objects, e.g., giving an imaginative object to the mother.

Elaborated Symbolic Play

1. symbolic manipulation of two or more materials in an appropriate relation in spite of having a meaningful manipulation with only one material, e.g., eating with a plate and a pair of chopsticks at a table, or holding a doll in one's arms with a paper as a substitute for a cloth.
2. various sequential symbolic acts on a theme, e.g., stirring in a cup with a spoon and then drinking from the cup, or pretending to take an imaginative food out of a shoulder bag and then feeding the mother.

Agent Use in Symbolic Play

Self:
symbolic play directed towards the subject himself or herself, e.g., drinking from a cup.

Passive other:
symbolic play directed towards the mother, the experimenter or the doll as if to treat them as mere recipients of his or her acts, e.g., bringing a cup close to the others' mouths as if to feed them.

Active other:
symbolic play directed towards the mother, the experimenter or the doll as if to have them actually participate in the acts, e.g., handing a cup to the mother or the experimenter and asking them to drink by gestures or verbally, or trying to have the doll hold a cup and drink from it.

Table 2 Rank-Order Correlations between Variables of Symbolic Play and Age in Months (Spearman's Coefficient)

Subjects	Percentage of occurrence	No. of different acts	
		Total	Elaborated
M.K.	.724**	.916**	.573*
T.T.	.929**	.909**	.924**
M.Y.	.115	.638*	.386
H.H.	.786**	.917**	.831**

* $p < .05$, ** $p < .01$, one-tailed.

Table 3 Initial Age in Months of Emergence of Three Types of Symbolic Play

Subjects	Imitative use	Substitution	Gestural[1)] representation
M.K.	15	15	—[3)]
T.T.	12[2)]	14	16
M.Y.	12[2)]	13	—
H.H.	12[2)]	13	22

Note. 1) of absent objects without any material support.
2) possibility of earlier emergence.
3) no emergence by 24 months.

Table 4 Percentage of Occurrence of Imitative Use within Symbolic Play

Subjects	Mean	SD	Range	r_s'
M.K.	76.07	19.68	50 - 97.06	-.291
T.T.	69.02	26.30	26.92 - 100	.096
M.Y.	90.95	15.10	42.59 - 100	-.202
H.H.	83.37	10.93	60.98 - 100	-.280

Note. r_s' is a rank-order correlation with age in months (Spearman's coefficient). No results are significant ($p > .05$, one-tailed).

Table 7 Percentage of Occurrence of Self Agent Use within Symbolic Play

Subjects	Mean	SD	Range	r_s'
M.K.	89.07	13.25	55.10 - 100	-.685*
T.T.	85.87	12.87	50.00 - 100	-.409
M.Y.	93.90	20.25	23.81 - 100	-.396
H.H.	93.96	5.79	83.64 - 100	-.816**

Note. r_s' is a rank-order correlation with age in months (Spearman's coefficient). * $p < .05$, ** $p < .01$, one-tailed.

Table 5 Comparison between Miniature Toys and Their Real Counterparts

	Subjects	Empty feeding utensils	Table[1]	Hat	Bag	Bedding
Initial age in months of pretend use upper : real objects lower : miniature toys	M.K.	unknown	unknown	18	17	14
		15	20	—[2]	21	—
	T.T.	12[3]	unknown	13	13	13
			—	14	14	18
	M.Y.	12[3]	unknown	17	14	16
			16	17	19	24
	H.H.	12[3]	unknown	15	12	18
			16	16	19	22
Similarity between real objects and miniature toys[4]	Size	1/3	1/17	1/4	1/10	1/12, 1/15 (1/30)
	Form	1	1	0	0	1
	Color	0	0	0	-1	-1
	Quality	1	1	1	-1	1

Note. 1) appropriate use with reference to empty feeding utensils.

2) no emergence by 24 months.

3) possibility of earlier emergence.

4) size of miniature toys to real objects. In the bedding, numerical values from left to right are size of pillow, coverlet and bed mat of a child (of an adult).
The similarity of form, color, or quality was estimated by a 3 rating scale. 1 = high similarity, -1 = low similarity, 0 = difficult to judge.

Table 6 Contents of Substitution

Subjects	Miniature Toys											Junk Materials			
	Tea-cup	Spoon	Chopsticks	Rice bowl	Plate	Table	Hat	Bag	Coverlet	Bed mat	Pillow	Twig (L)	Twig (S)	Twig (Y)	Paper
M.K.		straw (20)	cigarette (21) drumsticks (24)		ash-tray (21)	footstool (24) drum (24)			bath towel (22)		handker-chief(15)		spoon (18) cigarette (22)		packet for medicine(17) tissue paper (24)
T.T.		pencil (16)	pencil (20)			chair(14) car (16) horse(16) footstool (17) balance board(18) slide(20) train(21)	duster(14) towel (14)			pillow (24)	handker-chief(16)	gun (17) sword(17) ice-cream cone (20) telescope (21)	pencil(15) spoon (16) gun (17) chopstick (21)	spoon (15) gun (16) half-split chopsticks (20) airplane (22)	tissue paper (15) cloth (15) handkerchief (18) paper for ice-cream cone (20) plate (23)
M.Y.	container for sand play (22)	shovel (22)									duster (13)	spoon(16) chopstick (17)	chopstick (15) spoon (16)		candy wrapper (21) coverlet(24) tissue paper (24)
H.H.						footstool (17) chair(22)	cloth (17)	towel (17)	towel (15) bed mat (16) cloth (16)	pillow (23)	handker-chief(18) powder puff (19) bag for cosmetics (22)	spoon(14) chopstick (19) toy (23)	spoon (14) straw (18) chopstick (18) toy (23)	spoon (13) bedding beater(23) toy (23)	wrapping paper (14) packet for medicine(18) handker-chief (18) cloth (22) candy wrapper (22) plate (24) paper for art of folding (24)

Note. Underlined substitution emerged after imitative use of the same material. Numerical values within parentheses indicate the initial age in months of emergence.

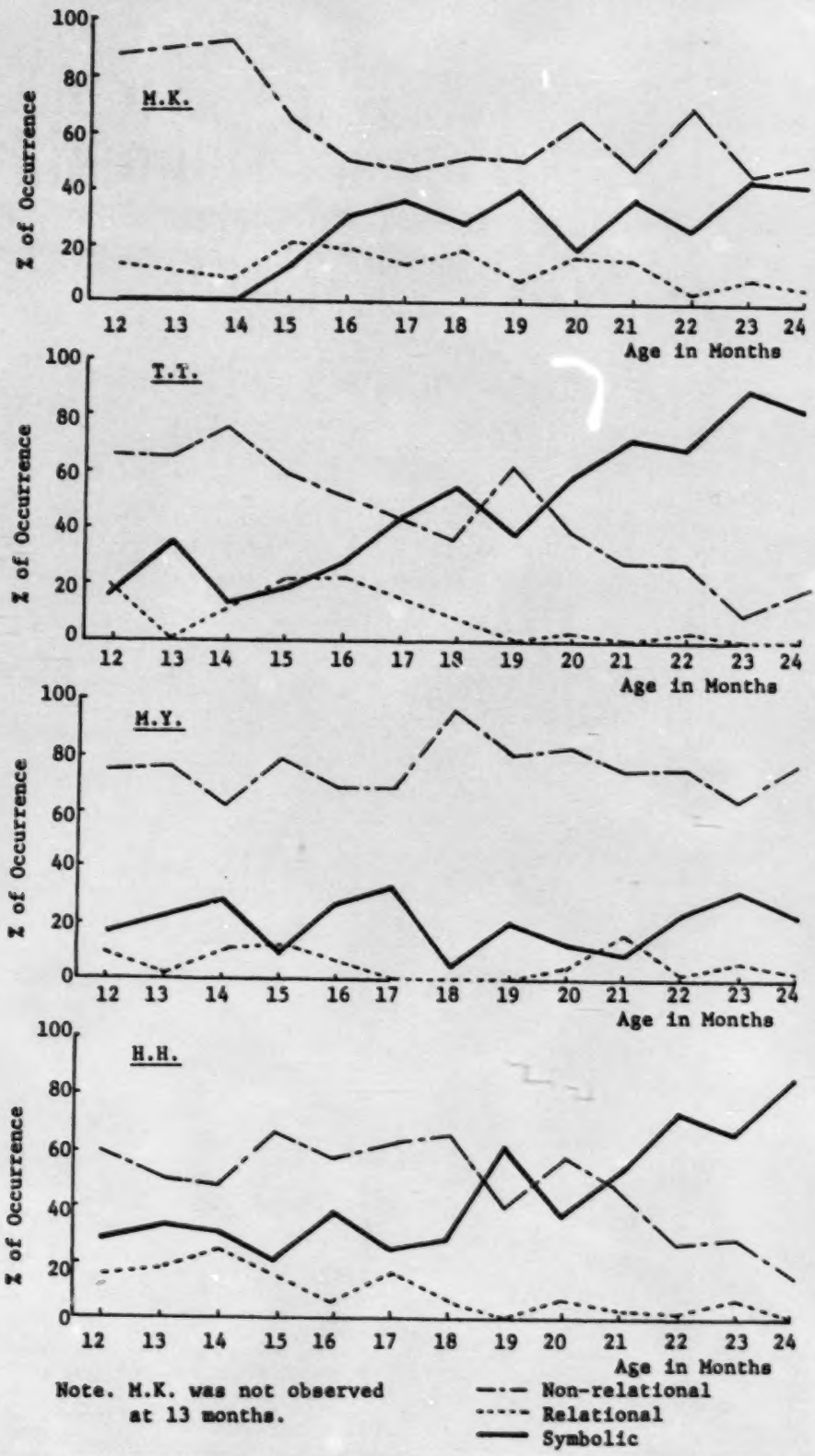
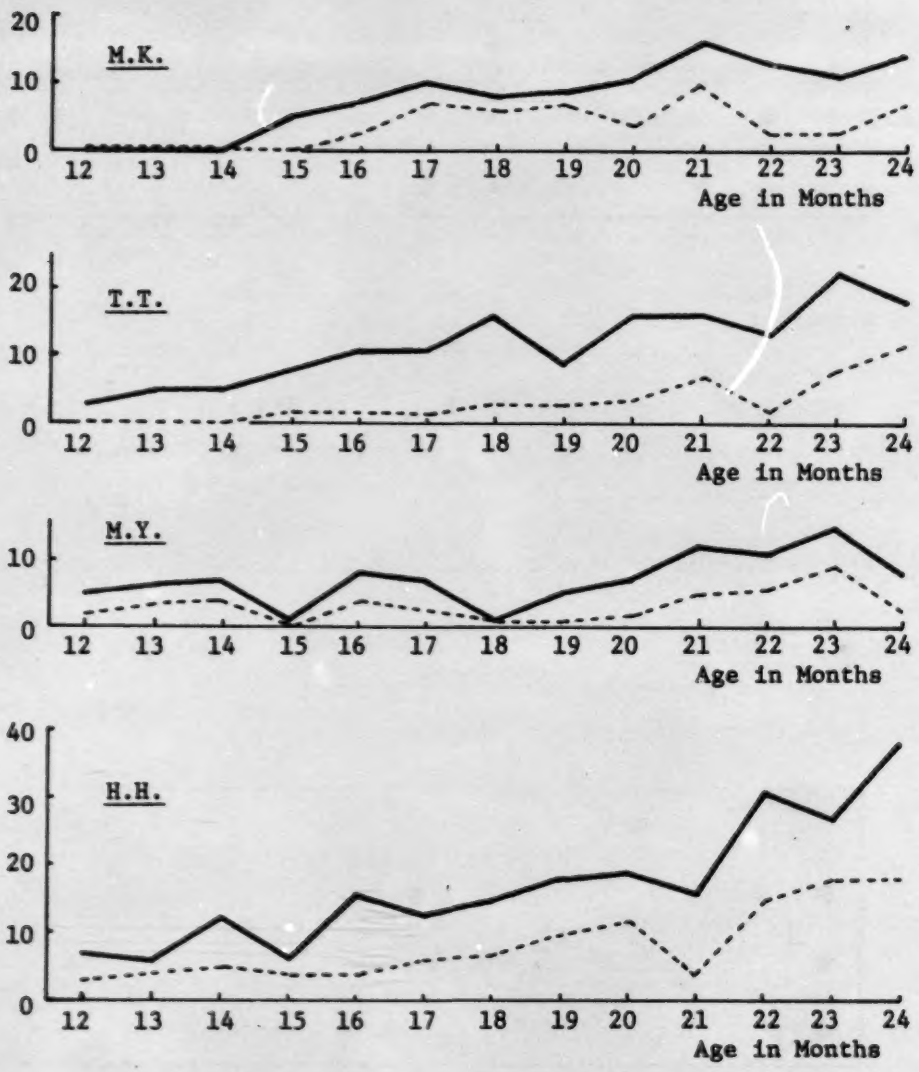
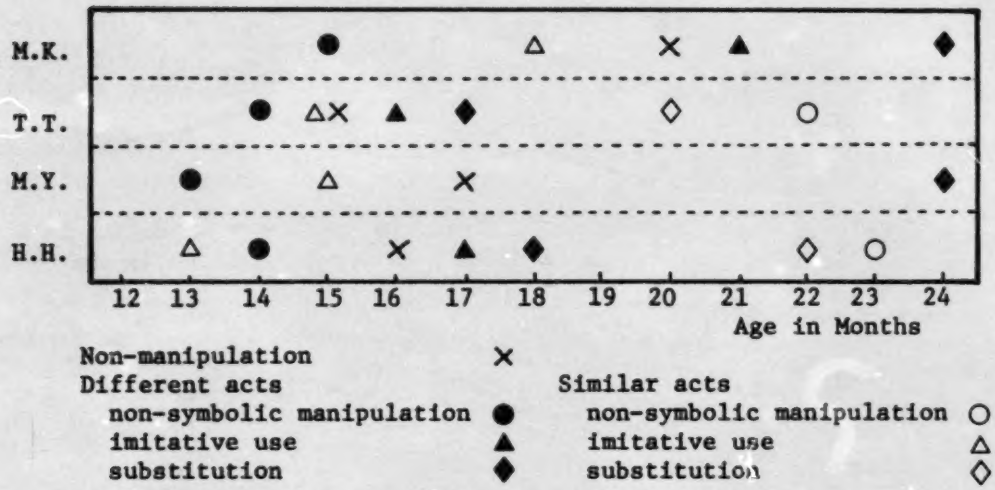


Fig. 1 Development of Manipulative Play



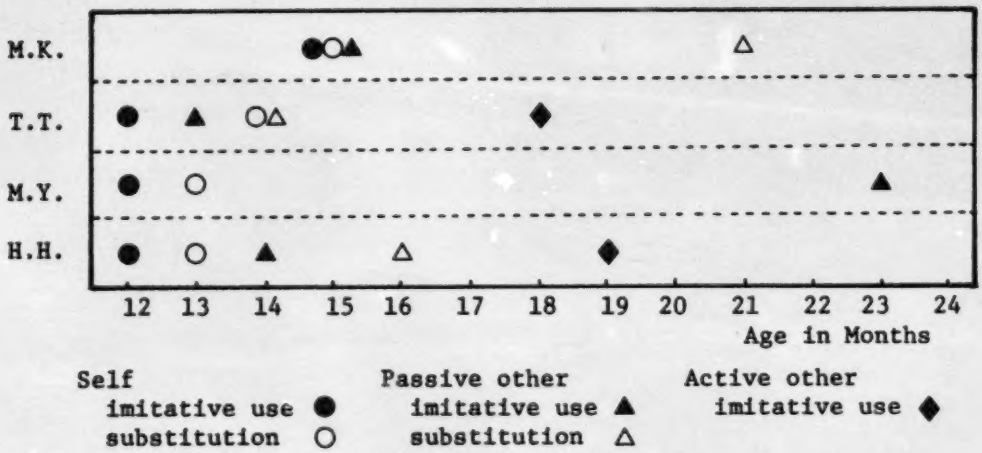
Note. M.K. was not observed at 13 months.

Fig.2 Number of Different Symbolic Acts



Note. Absence of a mark means no emergence by 24 months.

Fig.3 Initial Age in Months of Substitution with Reference to Its Preceding Manipulation



Note. Absence of a mark means no emergence by 24 months.

Fig.4 Initial Age in Months of Agent Use in Symbolic Play